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On the systematic position of *Inope* STAUDINGER, 1887 (Lepidoptera: Zygaenidae, Procridinae)

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Abstract: The genus *Inope* STAUDINGER, 1887 is transferred from Procridini to Artonini based on reexamination of characters of the type material of *Inope heterogyna* STAUDINGER, 1887 and *Aglaino maerens* STAUDINGER, 1887 The characters are discussed, the male and female genitalia and the hindlegs are figured.

Zur systematischen Stellung von *Inope* STAUDINGER, 1887 (Lepidoptera, Zygaenidae, Procridinae)

Zusammenfassung: *Inope* STAUDINGER 1887 mit der Typusart *Inope heterogyna* STAUDINGER 1887 wurde als monotypische Gattung beschrieben. Spätere Autoren stellten weitere Arten in diese Gattung, so daß wir in ALBERTIS Revision der Zygaenidae (1954) vier Arten dort finden, nämlich *I. heterogyna, I. maerens* (STAUDINGER 1887), *I. inconspicua* (STRAND 1915) und *I. fuliginosa* (MOORE 1879). ALBERTI (1954: 223 ff.) stellte *Inope* in die Tribus Callizygaenini der Unterfamilie Procridinae. EFETOV & TARMANN (1995: 86) transferierten *Inope* in die Tribus Procridini, nachdem zuvor TARMANN (1994: 120) die Callizygaeninae zur Unterfamilie erhoben hatte. Basierend auf Typenuntersuchungen, wurden die beiden Arten *Pollanista inconspicua* STRAND 1915 und *Artona fuliginosa* MOORE 1879 aus der Gattung ausgeschlossen. Die beiden verbleibenden Arten *Inope heterogyna* und *I. maerens* weisen Merkmale auf, die auf eine Zugehörigkeit zur Tribus Artonini hinweisen. Diese Merkmale werden diskutiert, und *Inope* wird zu den Artonini gestellt.

Inope was described by STAUDINGER in 1887 to accommodate the single species *heterogyna* STAUDINGER, 1887. His generic diagnosis reads as follows:

„Die Fühler des ♂ sind ziemlich lang gezähnt und sehr allmählich spitz verlaufend. Die einzelnen Kammzähne stehen etwas weiter auseinander, als bei *Ino*. Die Fühler des ♀ sind ziemlich gleichmäßig dünn, ganz glatt und mit stumpfem Ende. Der Saugrüssel ist ziemlich schwach, aber lang genug und gerollt. Die Hinterschienen haben zwei Paar sehr kurzer Spornen. Alle Flügel sind zeichnungslos, matt durchscheinend schwarz.

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Auf den Vorderflügeln ist Discoidale 1 gegabelt (Rippe 7 und 8 gestielt), was niemals bei *Ino* (u. *Northia*), aber bei *Aglaope Infausta* der Fall ist."

GRAESER (1888: 108) gives a short description of the larva which he found in May on *Pyrus*. In the same paper he describes a second species, *Inope impellucida* GRAESER. JORDAN (1907: 16) places a third species, *Northia ulmivora* GRAESER, 1888, in the genus *Inope*. There was a lot of confusion around this genus following a further paper by JORDAN (1913) in which he transferred *ulmivora* to *Illiberis* WALKER, 1854, and synonymized *Inope* with *Procris* FABRICIUS, 1807

Based on an examination of the genitalia, ALBERTI (1951: 144) concluded that *Inope* is probably not correctly placed in the near vicinity of *Illiberis* and may be more closely related to *Clelea* WALKER, 1854 and *Artona* WALKER, 1854. In his revision of the Zygaenidae, ALBERTI (1954: 223 ff.) places the genus *Inope* in the tribe Callizygaenini of the Procridinae with the four species *Inope heterogyna* STAUDINGER, 1887 (= *impellucida* GRAESER, 1888), *Aglaino maerens* STAUDINGER, 1887, *Pollanista inconspicua* STRAND, 1915, and *Artona fuliginosa* MOORE, 1879.

In EFETOV & TARMANN (1995: 86) *Inope* was excluded from the Callizygaeninae (raised to subfamily rank by TARMANN 1994: 120) and transferred to Procridinae, tribe Procridini. Reexamination of the characters of *Inope heterogyna* and *I. maerens* shows that these two species have to be transferred to the tribe Artonini. The two species *Pollanista inconspicua* STRAND, 1915, and *Artona fuliginosa* MOORE, 1879, cannot be included into the genus *Inope* s. str. at this moment. The main characters of Artonini are (TARMANN 1994: 120 ff.):

(1) chaetosema triangular, extending forward between the compound eye and the ocellus;

(2) abdomen with small dorsolateral evaginations on segments 2 and 7;

(3) valva fan-shaped with a stronger, sclerotized costal and basal margin and a very translucent, strongly folded central part.

Almost all eastern Palaearctic Artonini species have a single medial spur on the hindtibia in addition to the pair of apical spurs, a character that is never found in Procridini.

I. heterogyna and *I. maerens* are transferred to Artonini based on the following characters:

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(1) head dorsoventrally compressed, frons projecting, chaetosema extending forward between compound eye and ocellus, more so in *I. maerens* than in *I. heterogyna;*

(2) hindleg with three spurs, one medial and two apical (Figs. 5-10), a character that has already been recorded by TOTHILL et al. (1930: 39) for *Artona;*

(3) Valva slightly folded in *I. heterogyna,* less so in *I. maerens.*

The characteristic dorsolateral evaginations on abdominal segments 2 and 7 are absent. It is not clear whether this represents a primary character situation or is a secondary reduction.

Material examined

Inope heterogyna STAUDINGER, 1887

(/ = new line)

Lectotype ♂, Russia: "Wladiwostock / [H.] CHR.[ISTOPH]" (violet paper, handwriting H. CHRISTOPH), "10 / 6" (white paper, red underside, handwriting), "*Inope* STGR. / *Heterogyna* / STGR." (white paper, handwriting O. STAUDINGER), "Origin." (pink paper, printed), "Lecto- /Typus" (red paper, handwriting B. ALBERTI: "Lecto-", "Typus" printed), "Lectotype ♂ / *Inope heterogyna* / STAUDINGER" (upperside) "Präp. B. A. 516 / abgebildet / ALBERTI 1951/52" (underside) (white paper, handwriting B. ALBERTI) (ZMHB) (designated by ALBERTI, 1951: 144).

STAUDINGER (1887: 170) did not designate a holotype but mentiones 1 ♂, 4 ♀♀ in his original description. ALBERTI (1951) treats the single male syntype as a "holotype" (1951: 144) and as "die einzige ♂-Type" (1951: 145) but on the pin labels he wrote "Lectotype" (in his handwriting). However, following Article 74a of ICZN (1985) ALBERTI's treatment of the single male specimen of the syntypes as either "holotype" or "lectotype" is sufficient to be accepted as a valid lectotype designation.

Paralectotypes:

Russia: 1 ♀, [Wladiwostock], "10 / 6" (white paper, red underside, handwriting), "Origin." (pink paper, printed), 1 blue round label without inscription ([H. CHRISTOPH]) (ZMHB);

1 ♀, "Raddefskaja / [H.] CHR.[ISTOPH]" (violet paper, handwriting H. CHRISTOPH), "6 / 6" (white paper, orange underside, handwriting), "Origin." (pink paper, printed) (ZMBH);

1 ♀, "Askold / [F.] DÖRR.[IES]" (violet paper, handwriting H. CHRISTOPH), "Origin." (pink paper, printed), "Allo- / typus" (red paper, handwriting B. AL-

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BERTI: "Allo-", "typus" printed), "*Inope* ♀ / *heterogyna* / STAUDINGER" (upperside) "abgebildet / ALBERTI 1952" (underside) (white paper, handwriting B. ALBERTI) (ZMBH);

1 ♀, [Askold] "Origin." (pink paper, printed), 1 blue round label without inscription, "♀ *heterogyna*" (white paper, handwriting B. ALBERTI), "Präp. B. A. / 689" (white paper, handwriting B. ALBERTI) ([F. DÖRRIES]) (ZMBH).

In the original description, STAUDINGER (1887: 170) mentions: „CHRISTOPH fand von dieser neuen Art ein ♀ am 6. Juni bei Raddefka und ein Pärchen am 10. Juni bei Wladiwostok. Später erhielt ich von DÖRRIES noch 2 ♀♀ von Askold According to this original description the complete type series has been examined by us.

Further material examined:

Russia: 1 ♀, "Amur" (ZMHB); 1 ♂, Ussuriisky Krai [Primorye Territory], Suchan [Partizansk], 27 VI. 1928 (KURENTSOV) (ZIAN); 1 ♀, Sakhalin, Novo-Alexandrovsk (10 km N Yuzhno-Sakhalinsk), 30. VI. 1991 (KUPRIJANOV) (KAE); 1 ♂, Sakhalin, Novo-Alexandrovsk, forest, 17 VI. 1986 (M. NESTEROV) (KAE); 1 ♀, Kuril Islands, Kunashir, Dubovoe, Quercus/Betula forest, 19. VI. 1976 (ERMOLENKO) (KAE).

Inope maerens (STAUDINGER, 1887)

Lectotype ♂ of *Aglaino maerens,* Russia: "Raddefskaja / [H.] CHR.[ISTOPH]" (violet paper, handwriting H. CHRISTOPH), "9 / 7" (white paper, orange underside, handwriting) [in original description "9. Juni"!], "Aglaino STGR. / Maerens / STGR." (white paper, handwriting O. STAUDINGER), "Origin." (pink paper, printed), "Holo / Typus" (red paper, handwriting B. ALBERTI: "Holo", "Typus" printed), "*maerens*" (upperside) "abgebildet / ALBERTI / 1952" (underside) (white paper, handwriting B. ALBERTI) (ZMBH) (designated by ALBERTI 1954: 225).

Paralectotypes:

Russia: 1 ♂, [Raddefka], "Origin." (pink paper, printed), 1 blue round label without inscription, "9 / 7" (white paper, orange underside, handwriting) [in original description "9. Juni"!], "4" (white paper, handwriting), "*Inope* ♂ *maerens* / STGR" (upperside) "abgebildet / Paratypus / Wladiwostok" (underside) (white paper, handwriting B. ALBERTI) [mistake of ALBERTI! According to original description „Raddefka"!] ([H. CHRISTOPH]) (ZMBH).

1 ♀, [Raddefka], "Origin." (pink paper, printed), 1 blue round label without inscription, "9 / 7" (white paper, orange underside, handwriting) [in original description "9. Juni"!], "*Inope* ♀ / *maerens* / STGR" (upperside) "Original / No 3" (underside) (white paper, handwriting B. ALBERTI) ([H. CHRISTOPH]) (ZMBH).

In his original description, STAUDINGER (1887:171) mentions 2 ♂♂, 2 ♀♀: „Diese Art, von der mir CHRISTOPH 3 (2 ♂♂, 1 ♀) am 9. Juni [sic!] bei Rad-

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defka gefangene Stücke sandte, nöthigt mich wieder zur Aufstellung einer neuen Gattung. Ein ♀ dieser Art wurde noch von HERZ am 11. Juli, nördlich von Peking, gefangen." The type-series therefore consists of the three above mentioned specimens, and of one more ♀ (from Peking and collected on 11 July). This single female from Peking does not belong to *Inope maerens* and is the holotype of another species which was described by ALBERTI (1954: 315) as *Rhagades (Praeprocris) pseudomaerens* ALBERTI, 1954. This species was transferred to *Illiberis* WALKER, 1854 by EFETOV & TARMANN (1995: 67). It is labelled as follows: "11 / 7" (white paper, handwriting), "Typus" (red paper, printed), "Nord China / Peking HERZ" (white paper, handwriting O. STAUDINGER), "14" (white paper, handwriting), "Origin" (pink paper, printed), "*Rhagades* / ♀ / *pseudomaerens* / ALBERTI 1953" (upperside), "Paratypus von / *Aglaino* / *maerens* ♀ / STGR." (underside) (white paper, handwriting B. ALBERTI), "abgebildet" (white paper, handwriting B. ALBERTI).

Further material examined:

Russia: 1 ♂, 1 ♀, S. Primorye Territory, vic. Shkotovo, 7 VIII. 1986, in copula (S. SATSCHKOV) (Coll. SATSCHKOV); 1 ♂, 1 ♀, Primorye Territory, Khasansky district, Kedrovaya Pad' Nature Reserve, 17. VII. 1988 (♂), 3. VIII. 1988 (♀) (S. SINEV) (ZIAN).

Abbreviations of collections:

KAE	Coll. K. A. EFETOV, Simferopol, Crimea, Ukraine
ZIAN	Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia
ZMHB	Zoologisches Museum der Humboldt-Universität zu Berlin, Berlin, Germany

Discussion

The Procridinae were divided into the tribes Procridini and Artonini by TARMANN (1994). However, some groups of species cannot at present be clearly assigned to either tribe (e.g., *Clelea* group sensu EFETOV & TARMANN 1995: 83) and eventually it may be necessary to erect further tribes (after a comprehensive revision of the group). It is clear that *Inope* cannot remain in the Procridini and at present can be safely placed in the Artonini.

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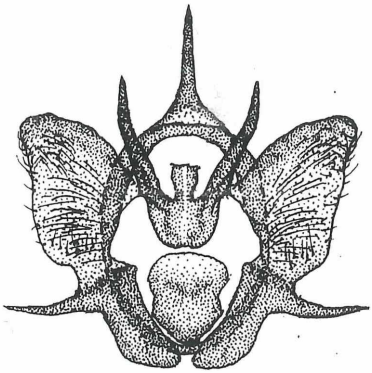

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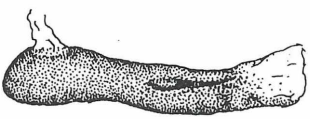

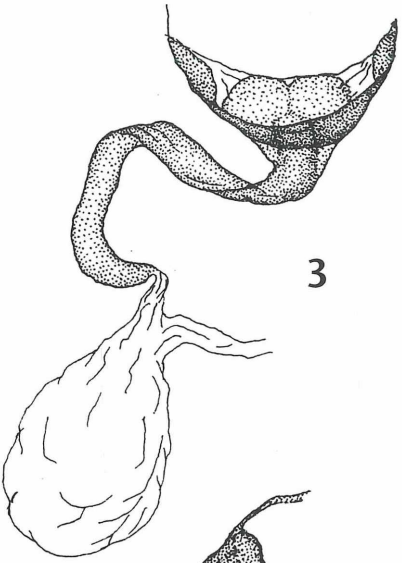

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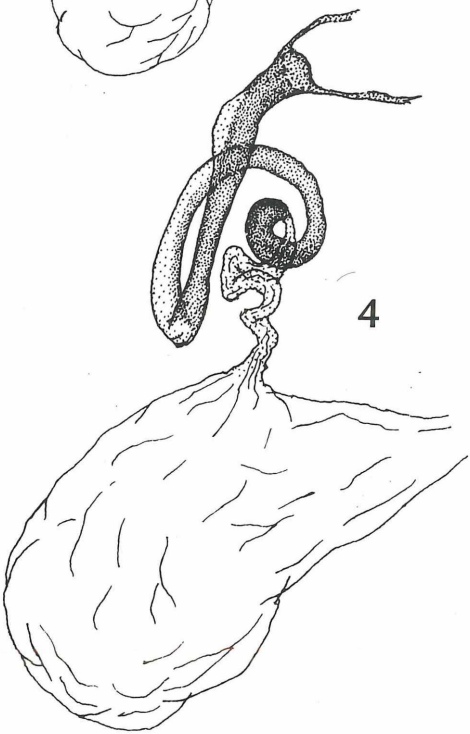

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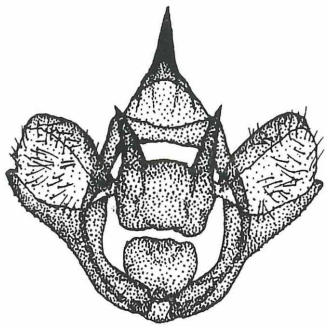

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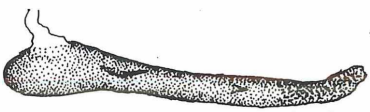

Fig. 1: ♂ genitalia of *Inope heterogyna* STAUDINGER, 1887. **Fig. 2:** ♂ genitalia of *Inope maerens* (STAUDINGER, 1887). **Fig. 3:** ♀ genitalia of *Inope heterogyna*. **Fig. 4:** ♀ genitalia of *Inope maerens*.

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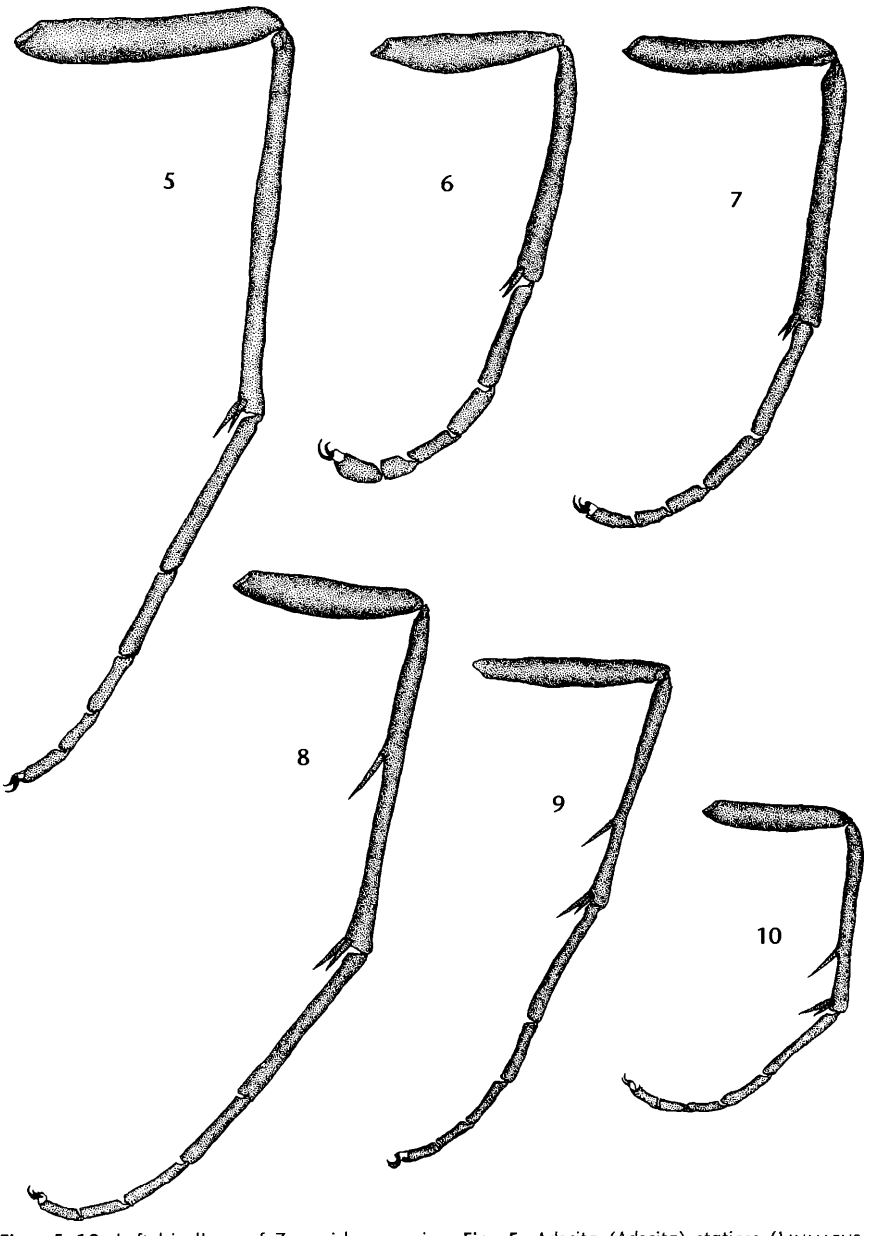

Figs. 5–10: Left hindlegs of Zyganidae species. **Fig. 5:** *Adscita (Adscita) statices* (LINNAEUS, 1758) (Procridini). **Fig. 6:** *Illiberis (Illiberis) assimilis* JORDAN, 1907 (Procridini). **Fig. 7:** *Illiberis (Hedina) consimilis* LEECH, 1898 (Procridini). **Fig. 8:** *Artona (Balataea) gracilis* (WALKER, [1865]) (Artonini). **Fig. 9:** *Inope heterogyna* STAUDINGER, 1887 (Artonini). **Fig. 10:** *Inope maerens* (STAUDINGER, 1887) (Artonini).

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